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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,237	05/13/2002	Peter John Mahon	11848/4	4011

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KENYON & KENYON
1500 K STREET, N.W., SUITE 700
WASHINGTON, DC 20005

EXAMINER

KALAFUT, STEPHEN J

ART UNIT	PAPER NUMBER
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1745

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DATE MAILED: 07/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/019,237	MAHON, PETER JOHN
	Examiner	Art Unit
	Stephen J. Kalafut	1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> . | 6) <input type="checkbox"/> Other: _____ |

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 41-43, 45 and 47 are rejected under 35 U.S.C. 102(a) as being anticipated by

Nagai (JP 10-294,135).

Nagai discloses a device which includes a housing (25), the lower end of which forms one terminal, with the upper end containing the other terminal (32). Within the housing is an electrochemical device, a battery cell (2), including electrodes (21, 22) and a separator (23). This cell would provide potential between the two terminals. Mounted to the outside of the housing is a flexible electric double layer capacitor (1), which includes two electrodes (11, 12) and a separator (13) therebetween, and an electrolyte within the separator (section 0015). The capacitor also includes a frame (16) and two electrode collecting plates (14, 15), which together would constitute a housing. One collecting plate (15) directly contacts the battery housing (25), which is, while the other plate (14) is connected to the other battery terminal (32) via a lead (17). Thus, the electrochemical device and the capacitor are connected in parallel. While Nagai does not use the term “supercapacitor”, his term “double layer capacitor” has the same meaning. Regarding claims 45 and 47, since the capacitor of Nagai is wrapped around the outside of a

battery cell, the capacitor itself would constitute part of a housing for the cell. See drawings 1 and 5, and sections 0010, 0013-0018, and 0025-0028. An English language translation of Nagai, obtained from the Japanese Patent Office website, is enclosed, and includes copies of Nagai's 9 drawings. It should be noted that the label for each drawing ("Drawing 1", etc.) appears above the drawing itself.

Claims 41, 48 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by either Liang *et al.* (US 3,811,944) or Thomas *et al.* (US 5,578,250).

Liang *et al.* disclose an energy storage device (10) including a housing (16, 18) with two terminals (26, 28), an electrochemical device (12) to provide potential between the terminals, and a capacitor (14) mounted to the housing by way of leads which extent from the cell to the terminals. As seen in figure 1, the cell and capacitor are inside the housing, which means that the housing has an interior defining a cavity. The terminals extend from the interior to the exterior of the housing, through a part (18) thereof. These would be capable of engaging with a load. The capacitor is connected across the terminals of the cell (column 5, lines 15-20), and thus in parallel with the cell, which would also mean that current from the two parts would be additive. Since the "predetermined load current" is part of a recitation of intended use, meaning that the load is not required to be present, recitations equating the load current and the current provided by the combined cell and capacitor are not given patentable weight. The cell includes electrodes (12-1, 12-2) connected to respective terminal leads, which function as electrode tabs. The capacitor also includes electrodes (62, 68) connected to respective tabs (66, 70).

Thomas *et al.* disclose an energy storage device (100) including a housing (52, 54) with several terminals (102), an electrochemical device (66) which provides potential between the terminals, and a capacitor (80) mounted to the housing by resting against its bottom portion (56). Since the electrochemical device and the capacitor are mounted within the housing parts (column 4, lines 28-36), the housing would have an interior defining a cavity. The terminals (102) are on the exterior of the top portion of the housing. As seen schematically in figure 1, the electrochemical device (12) and capacitor (14) are connected in parallel to the terminals, which would also mean that current from the two parts would be additive. The electrochemical device includes an array of contacts (88), while the capacitor includes a pair of contacts (82, 84) which connect the electrodes of the respective devices to the terminals. Since the “predetermined load current” is part of a recitation of intended use, recitations equating the load current and the current provided by the energy storage device are not given patentable weight.

Claims 41, 48 and 49 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by either Thomas *et al.* (US 5,849,426) or Harshe *et al.* (US 5,821,007).

Thomas *et al.* disclose an energy storage device (100) including a housing (52, 54) with several terminals (102), an electrochemical device (66) which provides potential between the terminals, and a capacitor (80) mounted to the housing by resting against its bottom portion (56). Since the electrochemical device and the capacitor are mounted within the housing parts (column 4, lines 27-35), the housing would have an interior defining a cavity. The terminals (102) are on the exterior of the top portion of the housing. As seen schematically in figure 1, the electrochemical device (12) and capacitor (14) are connected in parallel to the terminals, which

would also mean that current from the two parts would be additive. The electrochemical device includes an array of contacts (88), while the capacitor includes a pair of contacts (82, 84) which connect the electrodes of the respective devices to the terminals. Since the “predetermined load current” is part of a recitation of intended use, recitations equating the load current and the current provided by the energy storage device are not given patentable weight.

Harshe *et al.* disclose an energy storage device (10) including an electrochemical device (14), which is a battery, and a capacitor (16), contained within a housing (column 3, lines 36-38), and thus within the cavity defined by the interior of the housing. The housing also includes two terminals, each shown by the symbol >> in figure 1, which would be on the exterior of the housing. The capacitor has two orientations, but in either is connected to the battery in parallel (column 2, lines 48-51). The various lead lines in figure 1 would represent electrode tabs which connect the electrodes of the battery and the capacitor to the respective terminals. Since the “predetermined load current” is part of a recitation of intended use, recitations equating the load current and the current provided by the energy storage device are not given patentable weight.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Nagai, Harshe *et al.*, or Thomas *et al.* (either ‘250 or ‘426), all above, each in view of Thomas *et al.*

(US 4,738,919).

Nagai, Harshe *et al.*, and either patent to Thomas *et al.* do not disclose the relationship of the energy and power densities of the electrochemical device and the capacitor. Thomas *et al.* ('919) teach that battery cells have high energy densities, but may not be able to provide high power, which is sometimes required (column 2, lines 57-61), and that a capacitor may provide a burst of high power (column 3, lines 4-9). This would mean that of the two devices, the battery would have the higher energy density, while a capacitor may provide higher power density. This would provide the versatility needed to deal with various load requirements. For this reason, it would be obvious to design the electrochemical devices and capacitors of Nagai, Harshe *et al.*, or Thomas *et al.* ('250 or '426) so that the electrochemical device has the higher energy density and the capacitor has the higher power density, as taught by Thomas *et al.* ('919).

Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Harshe *et al.*, or Thomas *et al.* (either '250 or '426), all above, each in view of Nagai, also above.

This claim differs from Harshe *et al.* and either Thomas *et al.* patent by reciting the structure of the capacitor, which is a double layer supercapacitor. Nagai discloses a double layer capacitor, which includes two electrodes (11, 12), a separator (13) therebetween, an electrolyte within the separator (section 0015), and a housing constituted by a frame (16) and two electrode collecting plates (14, 15). Nagai teaches that a double layer capacitor has a higher capacity than ceramic, aluminum electrolytic or tantalum electrolytic capacitors or condensers (section 0004), and has an improved pulse discharge property (section 0008). For these reasons, it would be

obvious to use the double layer capacitor of Nagai as the capacitor in the devices of either Harshe *et al.*, or Thomas *et al.* ('250 or '426).

Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai as evidenced by Powerstream.

Nagai does not disclose the variously recited battery sizes, but these are conventional in the battery art, as shown by the list contained in the Powerstream internet page. It would be within the skill of the artisan to make the device of Nagai in sizes which are known in the art, to fit within the devices which consume electricity. For this reason, this claim would be obvious over Nagai, in view of evidence provided by Powerstream.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. An English language translation of Sakata *et al.* (JP 11-069,621), cited by applicants, is enclosed. Amatucci (US 6,517,972) discloses a hybrid battery supercapacitor system. Two web pages relating to supercapacitors are also enclosed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is (703) 308-0433. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

sjk
June 19, 2003



STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP 1900